UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MASSACHUSETTS 02109-3912

Clean Air Act Inspection Report

Drafted: September 6, 2022
Finalized: September 15, 2022

EPA Inspector: Darren Fortescue, Senior Enforcement Coordinator, Air Compliance Section /DEF/

EPA Reviewer: Elizabeth Kudarauskas, Acting Chief, Air Compliance Section /EAK/

Date of Inspection: August 25, 2022

Facility Name: American GreenFuels, LLC

ICISAir ID#: CT0000000900900925

Facility Location: 30 Waterfront Street, New Haven, CT 06512

Mailing Address: As above

Disclaimer:

Unless otherwise noted, this report describes conditions at the facility/property as observed by EPA inspector(s), and/or through records provided to and/or information reported to EPA inspector(s) by facility representatives and as understood by the inspector(s). This report may not capture all operations or activities ongoing at the time of the inspection. This report does not make final determinations on potential areas of concern. Nothing in this report affects EPA's authorities under federal statutes and regulations to pursue further investigation or action.

Inspection Attendees:

Name	Title	Organization
Darren Fortescue	Senior Enforcement Coordinator	EPA Region 1
Ming Chai	Plant Manager	American GreenFuels, LLC
Peter Baiardi	Health and Safety and Environment Manager	American GreenFuels, LLC

Facility/Process Description:

History

The facility located at 30 Waterfront Street, New Haven, Connecticut was originally owned by Greenleaf Biofuels, LLC ("Greenleaf") and started producing biodiesel on May 20, 2013. At that time Greenleaf worked with the tolling partner Kolmar Americas, Inc. ("Kolmar") to produce biodiesel. Kolmar owned and supplied the feedstock and owned the biodiesel produced at the facility. In turn, Greenleaf owned the plant and was paid a production fee per gallon of biodiesel produced. In addition, Greenleaf owned the glycerin co-product, produced during the production process.

In 2015, Kolmar bought the facility from Greenleaf and renamed the tolling partner to be American GreenFuels, LLC ("AGF").

Biodiesel Production Process

AGF primarily uses waste oil feedstock, which includes waste vegetable oil, yellow grease and animal fat to produce biodiesel. The production process is considered a continuous process.

The feedstock is initially treated using a tricanter and dryer to remove solids and water.

The treated feedstock undergoes an acid esterification ("AE") process in the AE reactor. This process involves adding methanol and sulfuric acid to the treated feedstock and the mixture is allowed to react. This process is used to convert the free fatty acid component of the feedstock into long-chain fatty acid esters, or biodiesel.

The AE treated feedstock then passes through the AE dryer to remove water and methanol from the mixture.

The AE treated feedstock then undergoes a transesterification ("TE") process in two TE reactors operating in series. This process involves adding methanol and sodium methylate to the AE treated feedstock and the mixture is allowed to react. This process is used to convert the remaining feedstock oil into biodiesel and the co-product, glycerin. The glycerin is decanted off after each TE reactor.

The biodiesel product then undergoes a three-step water wash purification process to remove impurities.

The biodiesel passes through a biodiesel dryer and then undergoes a polishing process. The polishing process involves the addition of absorbent diatomaceous earth ("DE") and Sipernat. The biodiesel is then passed through a series of screens that remove absorbed impurities.

Wet Glycerin Processing

The wet glycerin recovered from the process is held in the wet glycerin tank, where it is pH adjusted using sulfuric acid.

The wet glycerin is passed through two glycerin dryers to reduce the water and methanol concentration. The glycerin then passes through the glycerin tricanter. The tricanter recovers free fatty acids from the glycerin to be re-used as feedstock.

The remaining mixture is 75 to 80 % glycerin that is sold as a by-product.

Methanol Recovery and Emissions Control

The water and methanol recovered from the dryers and the purification system is fed through a distilation column to separate the two constituents. The recovered methanol is reused in the process and the recovered water is reused as wash water or treated and shipped off-site.

The residual methanol vapor from the distilation column is then fed via a vent header to a condenser for further methanol recovery. The vent header also captures emissions from Tanks TK 221, 901, 902, 903 and 904.

Prior to August 12, 2022, the final emissions from the condenser were treated using a Catalytic Combustion catalytic thermal oxidizer, Model SRCO 750G ("CTO").

Currently, the final emissions are being controlled by a Zephyr Portable thermal oxidizer, Model Number Zephyr-7_5-40 ("TO").

Process Boilers

AGF operates three process boilers with 1000, 600 and 200 horsepower capacities.

Number of Employees and Working Hours:

AGF operates 24/7, 365 days per year and employs 47 employees.

Potentially Applicable Clean Air Act Requirements:

40 CFR Part 60, Subpart Kb – Standards of Performance for Volatile Organic Liquids Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984
40 CFR Part 60, Subpart VVa – Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006
40 CFR Part 60, Subpart NNN – Standards of Performance for Volatile Organic Compound (VOC) Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations ("Subpart NNN")
40 CFR Part 60, Subpart RRR – Standards of Performance for Volatile Organic Compound Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes ("Subpart RRR")
40 CFR Part 63, Subpart EEEE – National Emission Standards for Hazardous Air Pollutants: Organic Liquids Distribution (Non-Gasoline)
40 CFR Part 63, Subpart FFFF – National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing

Previous Enforcement Actions:

On December 6, 2013, EPA issued Greenleaf a Clean Air Act ("CAA") Notice of Violation. On January 31, 2017, EPA and AGF signed and filed an administrative consent agreement and final order with penalty, settling an administrative enforcement case for violations of CAA New Source Performance Standard regulations. The assessed penalty was $192,000.

Opening Conference:

Entry

On August 25, 2022, at 08:45 am, EPA Region 1 inspector Darren Fortescue arrived at the AGF facility, located at 30 Waterfront Street, New Haven, Connecticut and met Ming Chai and Peter Baiardi of AGF. Mr. Fortescue initiated an opening conference.

Conference

Mr. Fortescue said that Brian Theodore and Elias Petersen of Kolmar had informed EPA that a fire had occurred in the CTO on August 12, 2022, and the unit is no longer operable. Mr. Fortescue asked facility representatives for a more detailed description of what had occurred on August 12, and what actions the facility had taken as a consequence of the fire.

Facility representatives provided the following details:

- On Friday, August 12, 2022, at 10 a.m. Donavan Nobel of AGF observed black smoke coming from the heat exchanger and catalyst section of the CTO.
- The CTO was taken offline, and a fire extinguisher was used on its exterior.
- At that time Biodiesel production was halted.
- The outer shell and insulation of the CTO was removed and a 2 to 3 foot hole was opened in the side of the heat exchanger section to investigate the cause of the smoke.
- It was determined that a fire had occurred in the CTO melting the heat exchanger piping.
- After it was identified that it would not be possible to quickly repair the CTO, AGF started looking for a replacement emissions control system. AGF could not find a replacement CTO, so it decided to temporarily install a Zephyr Portable TO, Model Number Zephyr-7_5-40.
- The TO arrived at the facility on August 19, 2022, and the piping necessary to supply flue gas and natural gas to the TO was constructed and installed.
- On Monday, August 22, 2022, biodiesel production was recommenced at approximately 75% capacity (60 gallons per minute feedstock flowrate).
- On the morning of August 25, 2022, it was identified that the vent header attached to the inlet of the TO was experiencing a slight positive pressure and the plant was shut down. This was done to install a blower on the inlet to the TO in an attempt to induce a slight negative pressure in the vent header, and this work is currently ongoing.
- Previously, when the CTO was installed and operating, there was a slightly negative pressure observed in the vent header on the inlet to the control system.
- A datalogger in the TO is currently logging the stack temperature in the TO.
- It appears that the temporary TO will be used at the facility for between three to four months. It is unclear what AGF will choose to do to control emissions long-term by way of either repairing the existing CTO or purchasing a new control system.

Mr. Fortescue asked if AGF had called the fire department when black smoke was observed. Facility representatives said that they did not observe an actual flame. Facility representatives said when the smoke was observed they used a fire extinguisher on the CTO and turned the unit off. Facility representatives said the smoke quickly abated, so they did not feel it necessary to inform the fire department that an incident had occurred.

Facility representatives said the fire did not appear to have damaged the catalyst and it is still installed in the CTO. Facility representatives said they had taken several photographs of the catalyst and sent the photographs to the Catalyst Combustion Corporation ("CCC"), the company AGF uses to maintain the CTO. Facility representatives said that CCC had told AGF that, from the photographs, the catalyst still looks good. Mr. Fortescue asked if AGF had tested or were

planning on testing the catalyst for reactivity. Facility representatives said AGF had planned on testing the catalyst; however, now that it was unlikely that it would be used again, they were not currently planning on following through with the test. Facility representatives said AGF had purchased a new catalyst and, in the event that the old one was identified as not functioning, the new catalyst could be installed.

Facility Tour:

The Ming Chai lead Mr. Fortescue on a tour of the facility.

Control Room

The group entered the control room in the main building. Mr. Fortescue documented that the feedstock pump monitor on the control screen read 0 gallons per minute. Mr. Fortescue also documented that the control screen indicated that the distilation column pumps were offline and the column pressure was reading 15 PSIA.

Ming Chai said the methanol storage tank headspace is connected to a vent header that passes through the condenser.

Mr. Fortescue observed that the control screen indicated the bypass valve to the CTO was open and the bypass flow meter read -0.17 lb/min.

Ming Chai said that it is expected that it will take at least one month to rebuild the blower for the CTO; however, he said that some of the replacement components don't meet a 1 DIV 2 Area Hazardous Classification. Ming Chai said it is still unclear what the best solution for repairing or replacing the CTO control device will be.

Temporary TO

The group proceeded to a location to the left of the main building, looking from the public road towards the bay.

Mr. Fortescue observed a large trailer had been secured in the area. Ming Chai said the unit that was located on the trailer was the temporary TO. Mr. Fortescue observed that the trailer contained piping and a large stack, approximately 50 feet tall and 6 feet wide.

Ming Chai pointed out the control screen of the TO. Mr. Fortescue documented that it displayed four temperature readings that read Upper Stack 93ºF, Mid-upper Stack 86ºF, Mid-lower Stack 84ºF and Lower Stack 83ºF. Ming Chai said temperature data is being collected and stored in a

datalogger physically located on the trailer. Mig Chai said that AGF is able to download the temperature data to a thumb drive to extract compliance data. Ming Chai said that AGF is currently working to try to install a data line directly from the TO to the control room, to allow plant operators to be able to see live temperature data from the TO. Mr. Fortescue asked if the firebox temperature is able to be monitored and Ming Chai said he was not sure. Mr. Fortescue observed what appeared ot be four thermocouples installed in the stack. Mr. Fortescue said if the four thermocouple locations on the stack were actually the temperature thermocouples shown on the display, and if no other temperature thermocouples are installed in the system, then it did not appear that the firebox temperature is currently being monitored.

Ming Chai said that there is currently no infrastructure, or testing platform, in place that would allow for a stack test to be completed. Mr. Fortescue observed that there did appear to be two perpendicular sample locations in the upper section of the stack; however, he also observed there is no current way to access them for a stack test.

Ming Chai said he was not sure if the vent stream flow rate to the TO is being monitored.

Mr. Fortescue observed piping had been installed connecting the main building to the trailer. Ming Chai said the piping directs the final vent stream from the location where the old CTO had been located to the TO, and a second line fed natural gas to the TO.

CTO

The group proceeded to a storage area located at the rear of the New Haven Terminal building.

Mr. Fortescue observed the main CTO catalyst and heat exchanger section of the CTO, that had previously been located adjacent to the AGF building, had been moved to the storage area. Mr. Fortescue observed that it appeared that the insulation and casing to the unit had been removed allowing visual access to the interior surface of the unit. Mr. Fortescue observed that towards the top of the unit a hole had been cut into the casing allowing access to the heat exchanger and it appeared that several sections of the internal pipes had been cut and removed. Mr. Fortescue observed that a second hole existed towards the bottom of the unit that appeared to have been created by a combination of a fire and mechanical cutting of the cladding. Mr. Fortescue observed that the lower section of the heat exchanger piping, visible through the lower hole, appeared to have melted and there was evidence that a fire had occurred inside the unit.

Ming Chai said the heat exchanger piping is made of stainless steel. Ming Chai said that the smoke observed during the incident had been seen leaving the top of the unit through the seams of the casing. Ming Chai said that, prior to the fire, the inlet temperature to the catalyst had generally been around 800°F, and the outlet temperature had generally not exceeded 900°F.

Mr. Fortescue noted that on a separate side of the unit a panel had been removed to allow visual access to the catalyst housing. Mr. Fortescue did not observe any evidence that a fire had occurred in the catalyst area of the unit.

Ming Chai said that during previous maintenance activities CCC had not indicated to AGF that there was an issue in the heat exchanger that might cause to a fire. Ming Chai said that during routine maintenance CCC would open a panel at the top of the heat exchanger and hydro blast the heat exchanger from the top, removing residue from the bottom.

Ming Chai said that other than identifying a few hotspots and cautioning AGF to avoid letting tri-canter fluid enter the system, no other issues had been identified.

Closing Conference:

Ming Chai and Mr. Fortescue attended the closing conference. Mr. Fortescue thanked Ming Chai for his time.

Ming Chai said that AGF had taken photographs of the CTO unit where the fire had occurred. Mr. Fortescue asked if AGF could supply the photographs to EPA.